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Evaluation of Effects of Agriculture value chain Development on productivity and Economic growth of Nigeria

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Abstract **Original Research Article**

There are series of activities that are involved in the process of agricultural production starting from inputs required for the production of agricultural products to when products get to the final consumers. A value chain represents a coordinated sequence of interconnected activities that collectively contribute to enhancing the worth of a product or service. Agribusiness activities contribute significantly to the sustainability of human life. It covers activities that begin from input production stage to a stage that ends with distribution of agricultural output to end users. Development of a vibrant value chain in agriculture is essential to ensure greater productivity and sustainable economic growth with a vibrant Gross Domestic product (GDP). However, development of a vibrant value chain in agriculture is hindered by numerous challenges which may include: paucity of funds, poorly implemented policies illiteracy, inadequate technology, insecurity, infrastructure deficit, unfavorable climatic conditions etc. This article focuses majorly on the evaluation of agriculture related value chain development on productivity and economic growth of Nigeria and factors affecting value chain actors of agribusiness and some of the inventions to ameliorate them. The study involved the use of quantitative research method and data generated were analyzed through descriptive statistics. The study engaged 100 respondents as the sample size. Finding from the study revealed that development of value chain in agriculture significantly contributes to productivity and economic growth of Nigeria. The findings of this study derived from agriculture value chain actors may be pertinent in the development of policies and strategic plans for ensuring economic growth.

Keywords: *Agricultural Value Chain, Agribusiness, Economic Growth, Productivity, Challenges in Agriculture, Value Chain Development, Policy Implementation, Infrastructure Deficit, Climatic Conditions.*

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INTRODUCTION

Understanding how to produce, buy, and sell things is a function of the value chain. Everyone is involved in the value chain, whether as producers of things, processors, retailers, distributors, financial institutions, service providers, or consumers of commodities (American Institute for Research, 2023). Consumers complete the value chain cycle by paying for the goods and services delivered. This will help the producer with his or her subsequent production. Every one of us is a consumer in some manner, even if we don't create. As a result, we are all tied to several value chains (farm radio international, 2013). Some activities are included in value chains, such as manufacturing, design, processing, packaging, distribution, marketing, and so on, until they reach the ultimate customers.

In agribusiness, the phrase "value chain" refers to all of the commodities and services involved in the transformation of agricultural inputs into outputs until they reach consumers. According to Farm Radio International (2013), the value chain in agriculture is "the people and activities that brings basic products from obtaining inputs and production in the field to consumers through stages". The value chain incorporates the interaction of people doing diverse roles that are connected together. In the value chain, individuals conduct business by

trading or transferring inputs, money, expertise, services, goods, and information. Actors in a specific value chain perform diverse roles in adding value to items. The value they provided to the value chain determines what they receive in return as profit. For instance, in the agricultural value chain for the production of Garri (processed food from cassava), addition of value is made via different actors at different stages after the farmer has harvested the cassava. The processor of the cassava is compensated when it is grinded and pressed. The next actor uses the appropriate equipment to sieve and fry it into a completed product. In all the stages, where there is addition of value payment is made for service rendered. Other actors also bundle and bag the processed product. The product can now be purchased in bulk stored and sold to retail outlets by wholesaler. The consumers can easily access it through the retailer. This sequential relationship could likewise apply to other agricultural products.

The development of a robust and productive agricultural value chain is critical to increasing productivity, job creation, and wealth production, all of which have an impact on economic growth.

LITERATURE REVIEW

A value chain is a collection of interconnected activities that work together to increase the value of certain commodities or services. It has players who work to enhance commodity production, processing, marketing, and delivery to consumers (World Bank, 2007). Porter (1985) defines value chain development as the "full range of activities and services required to bring a product or service from conception to sale in its final market." In the same vein, World Business Commercial for Sustainable Development (WBCSD) (2011) asserts that the value chain encompasses a broader variety of actions performed by farmers and farm laborers to carry a product from conception to end consumers and beyond. Value chains are structured and dynamic. The dynamics of a firm's qualities impact the structure of the value chain. Furthermore, the type of dynamics that an organization possesses influences how effectively its value chains work.

Value chain is organized both horizontally and vertically. The horizontal arrangement refers to increased organization, which is often in the form of a collective structure that may include producer groups. The vertical arrangement may need long-term collaboration between production and processing groups.

Agribusiness value chain finance

Access to funds is an important component of the value chain in agribusiness. The efficiency and sustainability of the value chain are dependent on financing. A lack of fund may hinder or obstruct the value chain process in agriculture. Value chain finance may be defined as the flow of finances to and from various points along a value chain (International Fund for Agricultural Development, 2012). Value chain finance refers to all financial services and support services that flow through a value chain to meet the basic needs and limitations of people involved in the value chain to ensure effectiveness in their business operation. Value chain finance includes two types of financing, this include internal and external value chain financing. The internal value chain includes finance that happens within the value chain. A classic example is when an agricultural product or input provider extends credit to farmers, or when a financially strong corporation advances funds to market intermediaries. External value chain finance is a type of financing that is typically provided from outside the value chain as a result of value chain relationships. A prominent example is when banks lend to farmers as a consequence of a trustworthy contract with the farmers as customers.

Value chain finance allows for the extension of agricultural financing, the increase of value chain actors' efficiency, and the strengthening of existing value chain links. It plays important roles in enhancing the quality and efficiency required to finance agricultural value chains.

This is accomplished in the following ways:

- Identification of finance is required to consolidate the chain.
- Modifying financial commodities to fit the participants in the chain.
- Reducing the cost of financial transactions by providing a direct discount on loan payments while selling things.
- Knowledge of the value chain and its links may be used to mitigate the risk associated with the chain and its sponsors. (IFAD, 2012).

Key stages in agriculture value chain

Agriculture production is typically separated into two aspects: crop production and animal production. Crop production is a critical component that accounts for the majority of food consumption. Crop production in Nigeria accounts for about 89.2% of national GDP from agriculture and is the greatest contributor to GDP generated via agricultural activities (CBN, 2007). It is a vast element of agriculture that includes the growing of several crop kinds. Crop production is the broadest component of agriculture, and it provides commercial possibilities for a large number of individuals. Human sustenance is dependent on food availability (UNIDO, 2008).

Livestock production is a type of agribusiness production in which farm animals are raised to provide food or money. Livestock production accounts for up to 40% of global agricultural output, increasing income creation and food security assistance for over 1 billion people (FAO, 2009). In Nigeria, livestock production contributes for 10% of total agricultural output and 8% of GDP (World Bank 2017).

Processing is an important stage in the agricultural value chain. Companies that process food play an important role in the agricultural industry. Agro processors help to turn raw agricultural output into commodities that may be consumed by end users or customers. Their functions contribute to reducing waste from produced crops that are excess during the harvesting season (FAO, 2009). There is a diverse range of processing enterprises in the agriculture industry. Examples include rice mills, palm kernel mills, flour mills, feed mills, and so on. Agro-processing has an important role in producing jobs and addressing the demands of multiple firms and agricultural product consumers (USAID, 2008).

Storage stage is a stage in value chain that focuses on activities that involve holding or keeping of raw materials, inventories or products from stage of production to delivery to the customers. This stage ensures right quantity or stock of goods or raw materials are available to meet up the supply necessary to handle demand from the customers. Effective storage is essential in value chain in order to maintain the continuity of production process and to meet the demands of the customers (Christopher, 2016).

Distribution as a stage under value chain entails the activities that are essential in the delivering of processed agricultural products from the producers to consumers. The main aim of this stage is to make sure that the commodities get to the consumers at the designated place, at the appointed time and to ensure that exact demanded quantity is delivered. It is associated with warehousing, fulfillment of order, transportation and management of distribution (Porter, 1985).

Marketing stage is a stage under value chain that is concerned with activities that help to promote sales of agricultural products or rendering of services to customers. Marketing activities may include advertising, pricing, market survey, strategic planning, studying the line of demand etc. The main aim of this stage is to make sure that the farm produce are sold to the consumers effectively to ensure the continuity of the production process (Porter, 1985).

Factors affecting the development of agribusiness value chain productivity

There are numerous factors that internally or externally affect the development of agriculture values chain in Nigeria. Some of them are critical for the success of value chain development in agriculture. Finance is one of the sensitive factors essential for development of agriculture value chain. Access to finance is a major determinant of agricultural productivity. Agriculture value chain actors need fund to be able to purchase farm inputs, adopt technology and innovation that will improve their productivity (World Bank, 2020).

Availability of good infrastructure such good road, electricity, water supply, storage facilities etc play vital role in the development of functional agriculture value chain. Where these infrastructures are deficient, productivity of value chain actors of agriculture is limited (Ahmed & Rustagi, 2020).

Farmer education, especially agricultural extension services and training, improves decision-making and adoption of innovations. Educated farmers are more likely to adopt agricultural innovations and engage effectively in agriculture value chain than farmers without any education (Asfaw et al, 2012). Moreover, Knowledge about market prices, consumer demand, and trends improves planning, reduces risks, and helps farmers optimize returns. Access to timely and accurate market information assists in effective value chain development in agriculture (Shepherd, 2011). Adoption of modern agricultural technologies plays prominent role in boosting agribusiness productivity. Adoption of mechanization for example, can boost productivity. However, adoption is lowered by insufficient funds (FAO, 2017).

A cooperative is another key factor in value chain development that promotes general interest of members. Farmer cooperatives provide members with access to bulk inputs, shared equipment, training, and stronger bargaining power in markets. It enables members to be able to enjoy economies of scale in production and marketing (Birchall, 2004). Government policies such as subsidies, agricultural incentives are instrumental in encouraging investment in agriculture. However, inconsistency or poor implementation of agricultural policies hampers the development of a vibrant value chain in agriculture (Fan et al, 2008)

Assessment of the relevance of value chain in agriculture

In agriculture, value chain evaluation can assist to identify present obstacles and potential possibilities. Solving the difficulties that face the agricultural value chain may assist to build a well-functioning agribusiness value chain that generates more money. Creating a powerful agribusiness value chain not only increases income, but also provides players with access to a steady and predictable source of income (Farm Radio International, 2013).

Adding value to agricultural goods has a significant role in creating job opportunities and decreasing poverty. It promotes increased productivity, which leads to wealth creation and economic growth, particularly in rural regions with abundant agricultural land (Bandara, 2014). The value chain in agribusiness helps to ensure food security. During agricultural harvesting seasons, significant amounts are wasted owing to a lack of information regarding value addition. Where there is a well-functioning value chain, food is secured to assure the supply of high-quality food all year. This increases the value of farmers' produce and generates more money (Farm Radio International, 2013).

Young people can be fascinated by value chain that is functional. Once young people recognize the potential and availability of a market for agricultural goods, they may be encouraged to enter the value chain. This would definitely assist to lower the pace of youth migration because they, too, can participate significantly and earn a living from it (Radio International, 2013).

Another significant benefit of value chains in agriculture is that they allow members to learn new skills in order to remain relevant in the value chain. Actors in the agricultural value chain must consider activities or strategies that will improve their product performance and marketability (Best et al, 2011).

Off-farm employment possibilities in rural agro-industries are produced as a result of the agribusiness value chain. Thus, it contributes to increased revenue production among rural households. It establishes a connection between the industry and agricultural industries. Furthermore, it analyzes experience and knowledge to better grasp contemporary circumstances. This makes it easier to establish policies and strategies that promote competitiveness across the agriculture value chain (FAO, 2017).

Enablers of the success of value chain in agribusiness

- Understanding the Demand Structure for Products: Knowledge of the commodity that people require and their preferences plays an important part in the success

of the agricultural value chain. It is foolish to continue producing and processing goods that buyers are not interested in purchasing. Thorough study is required to determine which products will be in demand (Best et al, 2011).

Sustainable relationships among value chain players: The relationships between agribusiness value chain participants can have a significant impact on their amount of business transactions. When there is a good connection amongst agribusiness actors, some of them can trust some of their merchants to buy goods or provide services on credit. However, if there is no cordial connection or some actors cannot be trusted due to a past breach of promise on products or services purchased, purchases on credit may not be permitted again (Kaplinsky et al., 2000).

- Access to financial support or help from financial institutions: Some value chain players will undoubtedly require financial resources in order to operate the value chain effectively. Obtaining a loan with a low interest rate may aid in the success of their activities. Financial assistance from the government in the form of agricultural input subsidies and incentives might potentially benefit the operations of agribusiness value chain operators (Best et al, 2011).
- The application of ICT aids in improving communication among agriculture participants throughout the value chain can ensure quick passage of information.. The utilization of Internet services enables the actors to share information with one another. As a group, generic information may be transmitted via the internet via social networking sites devices such as WhatsApp, Tweet text, Facebook Instantgram, and so on, which are accessible to all paying members. Transactions might be completed via the internet (Simchi-lev et al, 2003).

Similarly, Baloyi (2010) believes that organizations may establish websites to produce substantial value by allowing them to connect with other actors in the value chain. Aside from being a method of communication, ICT is an effective instrument for promoting goods and services to value chain participants. This facilitates commercial transactions between buyers and suppliers of a certain product or service.

Dynamic, inventive ideas: To ensure long-term success in the agriculture value chain, there must be a continual flow of innovations. This will improve the ability to adapt to market situations and boost competitiveness among value chain actors (Best et al., 2006).

Media coverage also contributes to the success of the agricultural value chain. Media outlets such as radio and television stations play an important role in the promotion of agricultural innovation. A radio agribusiness show helps to inform the audience on the advancement of the value chain. They provide a less expensive way for everyone to have access to knowledge on the benefits of agriculture, which might pique people's interest in participating in agricultural activities. Television programs about agriculture may be used to graphically present and demonstrate the advancement of the agricultural value chain to the general audience. The use of visual and audio aids such as radio and television by agricultural extension workers plays a significant role in sensitizing and motivating everyone about the importance of the agribusiness value chain in economic growth (Radio International, 2013).

The formation of cooperatives among agriculture operators will allow vertical and horizontal integration within the value chain. Cooperatives among actors will serve to promote the achievement of the group's common interests as well as team spirit, ensuring an effective value chain.

Challenges confronting value chain in agribusiness

The agribusiness value chain has significantly boosted economic growth, particularly in rural regions. Despite its significant contributions, several limits limit its potential.

Financial limitations are one of the most significant restraints influencing agricultural operators. The value chain players require access to funds in order to purchase critical inputs and implement technologies that will help them develop their businesses. Scarcity of money often hinders the growth of their industrial activity. Due to a lack of cash, farmers are often forced to sell their agricultural produce on the farm without adding any additional value that would have allowed them to earn a higher profit. As a result, the lack of cash inhibits agricultural output (American Institute for Research, 2023).

Women's participation in the agricultural value chain is constrained owing to domestic obligations. Women play an important part in the value chain. However, as compared to their male counterparts, they have a more difficult time getting huge amounts of land and funding. Furthermore, women are given increased responsibility for child care and are expected to handle housework, particularly in Africa. This will significantly restrict the amount of time they have available for farm labor. According to various research studies, women are frequently excluded from the financial marketing of agricultural or animal production (Cook et al, 2018).

A high rate of inflation is another limitation on the agricultural value chain. The continued high rate of inflation in Nigeria has an impact on the actions of participants in the agriculture value chain. The majority of agricultural inputs used in the manufacturing process, such as herbicides, fertilizers, and pesticides, are imported into the nation. The issue of an expensive dollar-to-Naira exchange rate has impacted the activities of agriculture value chain participants. The increase in the currency rate, along with inflation, has raised the cost of producing agriculture products. Some who are unable to cope with inflationary fluctuations must leave the industrial process or operate at a reduced level.

Another difficulty is bureaucracy in laws that support the agriculture value chain. Some agricultural policies and regulations require permission from a number of government departments before they may be implemented. The bureaucratic process causes delays in the execution of policies and regulations that promote the efficiency of the agriculture value chain. The agriculture value chain has suffered from a lack of political will and appropriate coordination among important parties responsible for the execution or monitoring of policies and laws (American Institute for Research, 2023).

Climate elements are essentially unpredictable. Rainfall, temperature, humidity, sunlight, wind, and other meteorological variables all have a significant impact on agricultural productivity. Delay or excess rainfall can have an impact on agricultural productivity. Extreme temperatures have a similar impact on agricultural and livestock productivity. Agribusiness production is inherently dangerous due to unpredictable weather conditions. Farmers and agribusiness actors may experience losses as a result of adverse shifts caused by these climate conditions. For example, drought caused by a delay in rainfall can result in agricultural losses, which always damage the agriculture value chain.

Assessment of the impact of value chain

Value chain analysis is a method for studying and evaluating a whole industry or a specific system inside a company. It aids in the examination of the expansion of value chains across several Nations, sometimes known as the "Global value chain" (Elvira 2018). A value chain analysis requires an understanding of the primary and secondary activities involved in the creation of products or services. Furthermore, the cost implications and value that different activities might bring to the manufacturing process should be established. Furthermore, there is a need to investigate the prospects for comparative advantage.

Value chain analysis is an excellent tool for understanding and contextualizing progress processes. Given the extent of value chain analysis, it is necessary to investigate both the sources and the beneficiaries who will profit from the value generated by the value chain. Value chain analysis must be dynamic, taking into account aspects that influence consumer behavior, such as social economic factors, culture, and gender, which affect or determine their capacity and willingness to pay for certain goods and services (Feame et al, 2012). Furthermore, it is important in determining the distribution of the types of benefits that players in the value chain might get (Kaplinsky et al. 2000). Value chain analysis serves as the foundation for disclosing the restrictions and advantages of the agricultural value chain, as well as the interventions that may be implemented to support the agribusiness players participating in the value chain (Takunda, Resilience food security activities, 2021).

RESULT AND DISCUSSION

The effects of factors affecting the development of agriculture value chain on productivity

According to Table 1, the study offers a descriptive analysis based on 100 respondents who rated the influence of various factors on agricultural value chain production on a 5-point scale. The study's findings show that all of the variables investigated as factors impacting agribusiness have an impact on agribusiness productivity. According to the research participants, financing is the most important factor influencing agricultural value chain growth. The findings imply that a shortage of funds might significantly reduce the output of agricultural players. Finance and technology have a significant impact on agricultural value chain productivity, whereas infrastructure, education, market knowledge, government regulations, and environmental circumstances all have a significant impact as factors in the research study. The research findings indicate that cooperatives and farm size have a moderate influence on the productivity of the agriculture value chain. This finding shows that deficiency in any of the aforementioned criteria will have a negative impact on the successful establishment of a thriving agricultural value chain. This is consistent with Genic's (2014) opinion that the performance and success of a company operation are heavily reliant on improving productivity-related aspects.

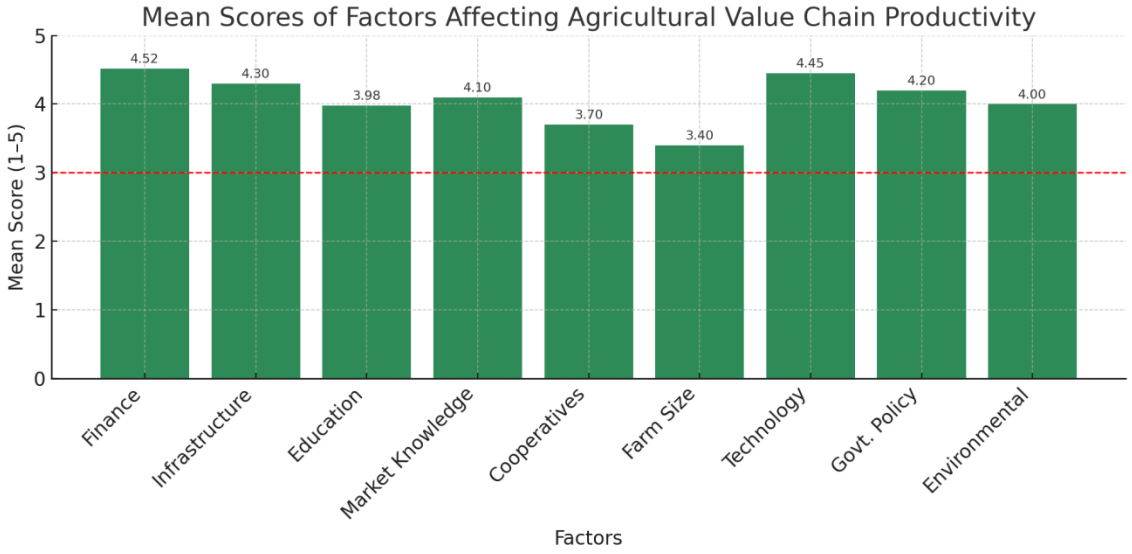
Table 1: Effects of factors affecting the development of agriculture value chain productivity

S/N	Factors	N0	Mean Score	Std. Dev.	interpretation
1	Finance	90	4.52	0.68	Very high effect
2	Infrastructure	84	4.30	0.75	High Effect
3	Education	72	3.98	0.89	High Effect
4	Market Knowledge	75	4.10	0.82	High Effect
5	Cooperatives	70	3.70	0.90	Moderate Effect
6	Farm Size	64	3.40	1.00	Moderate Effect
7	Technology	87	4.45	0.71	Very High Effect
8	Govt. Policy	80	4.20	0.76	High Effect
9	Environmental conditions	71	4.00	0.88	High Effect

Source: Field Survey, 2025

In figure 1, the chart illustrates the average scores assigned to each factor based on perceived impact on agricultural value chain productivity. Finance, Technology, and Infrastructure respectively are seen as the most critical factors. The results imply that finance, infrastructure, education, market knowledge, cooperatives, farm size, technology, and government policy have a significant positive impact on agriculture value chain productivity. Environmental condition has a significant negative impact.

Figure 1: Bar Chart Visualization



The effects of value chain development on productivity and economic growth

To ensure short run fluctuations are captured, the Vector Error Correction Model (VECM) was used and the result generated is presented below.

Table 2 suggests that deviations from long run equilibrium connection between GDP and the explanatory variables could be corrected through the VECM. The co-efficient shows a faster annual adjustment of -0.002415. This shows that within a year short-run disequilibrium, 2.526% of the adjustment to the long-run has taken place. R2 from the result is 0.682327. The implication of this is that the model could only explain about 68.2327% of the summation of the changes variations GDP that are explained through the independent variables which include Animal production (AP) Crop Production (CRP), Processing of farm produce (PFP). The 31.7673% variations that remain are due to other variables which are not included in this model. The result implies that value chain in Animal production (AP) Crop Production (CRP), Processing of farm produce (PFP) are statistically significant because their respective values (0.0165, 0.0054 and 0.0222) are less than 0.05 at 5% level of significance. Moreover there is a positive relationship between them and the GDP. This result is in tandem with the assertion of Emeka et al (2024).

Table 2

Vector error correction model (Vecm) System equation				
Variable	Coefficient	Std.Error	t-Statistic	Prob
C	0.035582	0.015248	2.232872	0.0225
D(GDP(-1)	0.371343	0.1587883	2.12825	0.0228
D(AP(-1)	7.86306	1.12E-04	0.60318	0.0165
D(CRP(-1)	0.007283	0.022116	0.236322	0.0054
D(PFP(-1)	0.00832	0.052504	0.137221	0.0222
VECM(-1)	-0.002415	0.003711	3.550756	0.0154

R-squared = 0.682327 F-statistic = 11.611713 Durbin-Watson = 1.889044

Source: Researcher's Compilation, 2025

IMPLICATIONS

The result findings from the factors affecting value chain imply that development of formidable and vibrant agribusiness value chain needs to ensure the availability of the aforementioned factors. As availability of fund was identified as the highest factor affecting value chain development, necessary interventions should be made by the government to assist in the provision of fund and other supports to aid the activities of value chain actors in agriculture.

Result from VECM reveals the Coefficient of animal production (AP), Crop Production (CRP), and Processing of farm produce (PFP) are 7.86306%, 0.007283% and 0.00832% and their τ-statistics are 2.60318, 3.236322 and 1.137221. Also, their respective p-values are
(0.0165, 0.0054 and 0.0222) which implied their statistical significance. Therefore, the results imply that just 1% increase in Animal production (AP) Crop Production (CRP), Processing of farm produce (PFP) on the average, will result respectively in closely 7.86306%, 0.007283% and 0.00832% increase in economic growth of the value chain variables. This assertion is in conformity with endogenous growth theory with emphasis that economic growth can be achieved through diversification of economy via increase in Animal production, Crop Production, Processing of farm produce and other agricultural means other than depending on only crude oil.

CONCLUSION

The result findings from the research showed that development of value chain in agribusiness plays vital role in productivity and economic growth of Nigeria. However, its success is affected by some notable factors. Finance was identified as a prominent factor affecting value chain development in agribusiness coupled with availability of other factors such education, government policies, cooperatives, technology, infrastructure etc.
The study also revealed that value chain in animal production, crop production and processing of farm produce has significant impact on Nigerian Gross Domestic Product (GDP). Therefore, government should provide necessary support that could strengthen the value chain of agricultural production to help in boosting productivity and economic growth of Nigeria. These findings can inform policy and investment decisions to improve productivity in the agriculture sector.

RECOMMENDATIONS

Convenient means of accessing funds or capital should be provided at low interest rate to support agriculture value chain actors to boost their productivity.

Conducive environment such as good security outfit, good infrastructural facilities, should be provided. In addition, subsidies and incentives should provided to aid their productivity.

Favorable agribusiness policies that can stimulate and agribusiness activities should be enacted by the government.
Both internal and external factors affecting value chain development in agribusiness should be well addressed by both the private organizations and the federal government so that the agribusiness value chain actors can have access to necessary supports that can enhance smooth running and sustainability of their business activities.

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